Experimental Research on Small Group Teaching Model in College Aerobics Teaching Under the Background of Big Data

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Keywords: Big Data, Small Group Teaching Mode, College Calisthenics Teaching, Literature Reference Research Method, Second-Order FDTD Method

Abstract: In recent years, with the development of university education reform, many problems in sports have attracted the attention of athletes, and endless measures and suggestions have been put forward to improve physical education classroom teaching. Physical education teachers are ready to stimulate people's interest in sports, cultivate students' skills, increase sports learning opportunities, and explore new teaching methods and teaching models. In this case, a group teaching model was proposed and used for physical exercise. This article mainly introduces the literature reference research method, the second-order FDTD method and the case study method. This article uses the second-order FDTD method to study the experiment of small group teaching mode in college aerobics teaching, and establishes a potential mathematical model. The model is solved by the second-order FDTD method, and the experimental research status of the small group teaching mode in college aerobics teaching is evaluated, and the model is revised using historical data to improve the experimental research of the small group teaching mode in college aerobics teaching the accuracy of the assessment. The experimental results of this paper show that the second-order FDTD method improves the experimental research efficiency of the small group teaching mode in college aerobics teaching by 23%. Finally, by comparing the difficulties in the implementation of the small-group teaching model and solving analysis and analyzing the influence of the small-group teaching model on students' aerobics learning interest, it systematically explained the influence of the small-group teaching model on college aerobics teaching.

1. Introduction

1.1. Background and Significance

In recent years, small group teaching has become an important form of modern physical

education. The value and promotion of physical education in colleges and universities across the country plays a unique role in ensuring the self-confidence, innovation, independence and social adaptability of college students [1]. Bodybuilding is a new sporting event that combines gymnastics, dance and music, fitness, bodybuilding and fitness functions [2]. Implementing the new educational concepts and group teaching methods in gymnastics courses in ordinary colleges and universities will help to change the traditional gymnastics teaching methods, effectively emphasizing the status of students as the main body, and giving full play to the role of thinking [3]. The group education model of physical education class divides students into research groups according to the characteristics of group members' interaction, mutual support and competition [4-5]. Under the guidance of physical education teachers, professors and students, group students, organizations and peers interact with each other to learn and take care of each other, thereby increasing students' learning motivation and learning motivation, improving learning quality, and formulating student social strategies [6- 7].

1.2. Related Work

Ma Z provides a method that can evaluate participatory stakeholder innovation in a complex stakeholder environment to solve essential problems [8]. Based on the principle of common value creation, he proposed a research framework that illustrates the experimental research process of small-group teaching mode in college aerobics teaching. In this process, stakeholders integrate their resources and abilities to develop innovations the second-order FDTD method [9-10]. In order to evaluate this evaluation framework, a number of data were collected in the study. This case represents the significance of the second-order FDTD method for the experimental research and system realization of the small group teaching mode in college aerobics teaching [11-12]. But because the message collection process is too complicated, the data result is not very accurate.

1.3. Main Content

The innovation of this article lies in the literature reference research method, the second-order FDTD method and the case study method. Based on the experimental research of small group teaching mode in college aerobics teaching, the experimental research of small group teaching mode in college aerobics teaching is evaluated by the second-order FDTD method. Establish the calculation method of the second-order FDTD method combined with the literature research method to provide guidance for the experimental research of the small group teaching mode in the college aerobics teaching.

2. Experimental Research Methods of Small Group Teaching Mode in College Aerobics Teaching

2.1. Literature Reference Research Method

Literature research method is a way to understand scientific literature information through scientific research. In the process of collating theories and cases related to the ideological and political education of party members, the author needs a lot of data and useful literature. Consult the electronic resources and paper materials of the school library, purchase relevant books, and use the Internet to search for relevant materials, and extensively collect relevant reports, policies and statistics from the party and government departments to ensure a comprehensive and correct

understanding.

2.2. Relevant Rules and Laws

Define A and B as two different attributes, and the correlation EO represents the possibility that attribute B exists under the condition that attribute A exists. Correlation is an indicator of the correlation of rules C—D in correlation rules. It represents the correlation between the antecedent and subsequent parts of the rule. The correlation measures between all sets are in the interval [H, the closer the correlation is to the stronger the correlation, the closer the correlation is, the weaker the correlation.

In the association rules, support and confidence need to set two minimum thresholds. When the correlation has a lower bound, both support and confidence have a lower bound, and the support and confidence can be adjusted only by adjusting the parameter K. Nether. In the calculation formula of the correlation degree, with the increase of K, the rule with low support degree will be severely punished and the correlation degree is also very low. In other words, when #A is very small, as K gradually increases, K gradually plays a decisive role in the denominator.

Therefore, when K is large enough, the correlation of low-support rules is very low, so the low-support rules can be filtered out by adjusting K in the calculation formula of correlation. This is also an improvement of related rules mining relative to association rules. Those rules with low support and high confidence that are largely accidental are filtered out, but association rules cannot filter out these possibly accidental rules. Because the formula of correlation is the adjusted confidence, that is, a positive parameter K is added to the denominator of the confidence, so the correlation of a rule is always less than the confidence. Therefore, only when the support and confidence of a rule are large, its correlation is likely to be large, that is, a large support and confidence are a necessary condition for a large correlation. When the correlation degree has a lower bound, both the support degree and the confidence degree have lower bounds. The formula is as follows

$$E_O\left(C \to D\right) = \frac{\Delta C \cup D}{\Delta C + E} \geq \phi \qquad (1)$$

When the adjusted confidence degree, that is, the correlation degree has a lower bound, both the support degree and the confidence degree have lower bounds.

$$con\left(C \to D\right) = \frac{\left(C \cup D\right)}{C} \geq \phi \qquad (2)$$

Among them, is the setting interval.

2.3. Case Study Method

The case study method is a method of tracking the behavior of a specific individual or group. It includes collecting and recording one or more case materials and generating case reports. On-site data collection is called "field research" and usually uses methods such as observations, interviews, collection of documentary evidence, descriptive statistics, tests, questionnaires, images, movies, or videos.

3. Experiment of Small Group Teaching Mode in College Calisthenics Teaching

3.1. Experiment Design of Small Group Teaching Mode in College Calisthenics Teaching

In this article, each lottery selected eight general aerobics courses for girls, randomly selected four categories for the experimental study, and divided the lottery into two experimental categories and two control categories. The number of students in the experimental class is 40 and 35, and the number of students in the control class is 42 and 33. The experimental study involved 150 people. The control class uses the traditional learning model, and the experimental class implements the learning model in small groups.

The experiment lasted from January 18th to September 19th. The aerobics teacher conducted an experimental class and a control class. In addition to the various teaching methods of the experimental class and the control group, the training time is 18 weeks, 1 hour per week, 36 hours in total, and each class lasts 45 minutes. The fourth level standard (the second group) and physical exercise, the training process remains unchanged.

3.2 Experiment Data Collection of Small Group Teaching Mode in College Aerobics Teaching

Tests are performed after completing each textbook, and the test time is 6, 12, 18, and 19 weeks of the experiment. The scoring standards for pedal lift, foot rotation, fixed ball and aerobic exercise in the experimental category and the control category are the same. Four classes are randomly selected from the eight aerobic exercise general education courses in the course, and randomly assigned to two experimental classes and two control classes to ensure that the previous experimental classes and control classes are equal. The difference between the experimental group and the control group uses an independent sample difference test to monitor the impact of the results before and after the test. The experimental results are shown in Table 1:

Table 1. Comparison data table between experimental class and control class

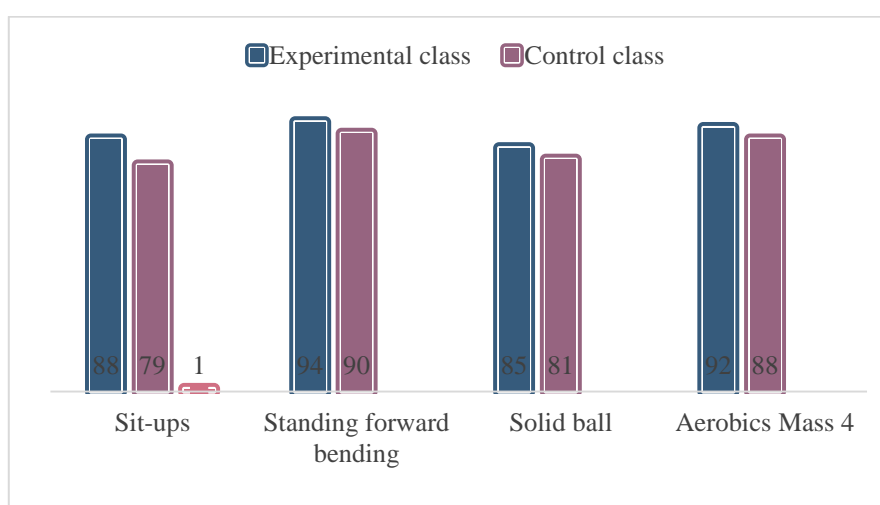|	Sit-ups	Standing forward bending	Solid ball	Aerobics Mass 4
Experimental class	88	94	85	92
Control class	79	90	81	88

Figure 1. Comparative data analysis diagram between experimental class and control class

It can be seen from Table 1 that the students in the experimental class using the small-group teaching model have higher scores in the public four levels of sit-ups, standing forward bends, solid ball and aerobics than the control class using the traditional teaching model. The average score of the class is 5.25 higher than the average score of the control class. In order to be able to see the relationship between the experimental class and the control class, data analysis was carried out on Table 1. The analysis results are shown in Figure 1:

It can be seen from Figure 1 that the collective teaching model can be used in college aerobics classes and can play its unique role. The use of group teaching mode in college aerobics can improve the cohesion and collaboration awareness of the student group, improve the interpersonal relationship of the students, improve the interpersonal skills of the students, promote the mental health of the students, improve the status and interest of the students, and improve the learning and the society of the students To help students master aerobic skills.

4. Experimental Analysis of Small Group Teaching Mode in College Calisthenics Teaching

4.1. Difficulties in the Implementation of Small Group Teaching Mode and Analysis of Solutions

The group learning model must have strong observation and analysis skills, planning and organization skills, teacher control skills and leadership skills. They not only need to master rigorous knowledge of physics, but also need to master a certain degree of psychology and sociology. Students must have strong learning and organizational skills, and master the necessary social skills. Due to the limitations of their own quality, different teaching conditions and the limitations of traditional education concepts, many teachers and students often feel powerless and cannot easily use the group study mode.

Usually, the teaching time is insufficient and the group teaching mode is rich in content, and more independent study time is needed so that students can better play the role of this mode. However, the study time or the emphasis on sports time still cannot fully guarantee my country's current physical education. In view of the general lack of investment in sports in Chinese universities, it is impossible to guarantee the use of various methods necessary for teaching in small groups, which may affect its application in sports.

This model is relatively heavy, and the group teaching model has rich educational content and many educational connections. For example, teaching organization includes classroom learning, group learning and individual learning. Evaluation includes final evaluation, process evaluation and diagnostic evaluation. There are teacher evaluation, group evaluation, student self-evaluation and student mutual evaluation. Because the template has many links and content, it is often difficult for teachers and students to master it. In the small-class teaching model, students have greater learning autonomy and can easily and effectively carry out group activities, but the active participation of some students is not enough. Due to limited energy and ability, teachers are more likely to lose strength and ability. Because group learning activities are easily out of control, it is difficult to provide time for teaching and development.

4.2. Influence of Small Group Teaching Mode on Students' Interest in Aerobics Learning

Fun is the motivation for students to learn and participate in sports, and students are the most important part of understanding and learning. Only students who are interested in aerobics classes and students whose aerobic fitness classes meet their internal needs can consciously, actively and

actively participate in aerobics classes. Before and after the experiment, we conducted a questionnaire survey on the students' interest in learning aerobics. The results are shown in Table 2:

Table 2. Comparison of the differences in learning interest between the small group teaching group and the traditional teaching group

Group	Very interested people%	Interested people%	Not interested%
Small group mode teaching group before experiment	26%	40%	34%
Experiment,post-small group mode teaching group	50%	30%	20%
Traditional Model Teaching Group Before Experiment	23%	43%	34%
Traditional Model Teaching Group Before Experiment	24%	40%	36%

As can be seen from the data in Table 2, before the experiment, the experimental group (group learning mode group) and the control group (traditional learning mode group) were compared. Then, after six months of research, the experimental group (group learning model) has 26%, 40%, and 34% interest in learning experiments, and 50%, 20%, and 30% interest in learning and post-examination respectively. In order to be able to see the relationship between the experimental class and the control class, data analysis was carried out on Table 2. The analysis results are shown in Figure 2:
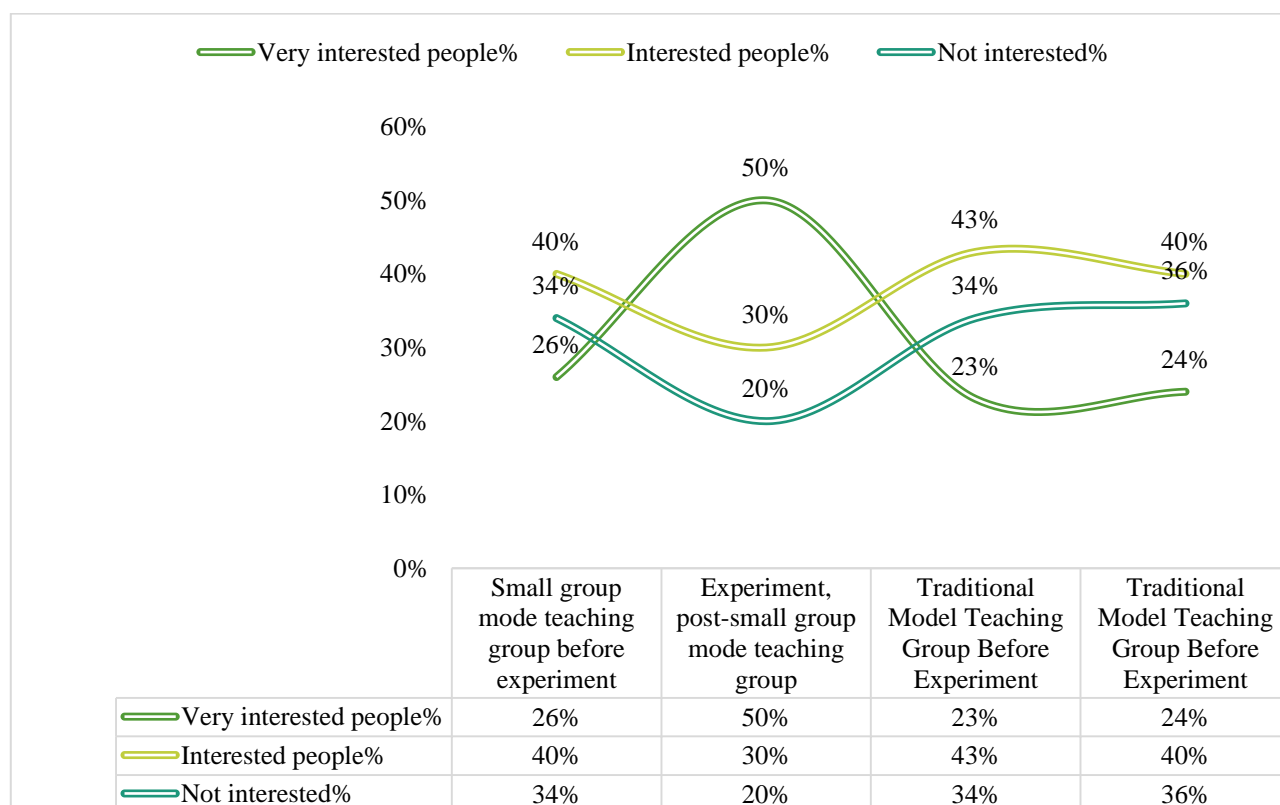

	Small group mode teaching group before experiment	Experiment, post-small group mode teaching group	Traditional Model Teaching Group Before Experiment	Traditional Model Teaching Group Before Experiment
Very interested people%	26%	50%	23%	24%
Interested people%	40%	30%	43%	40%
Not interested%	34%	20%	34%	36%

Figure 2. Comparison of the differences in learning interest between the small group teaching group and the traditional teaching group

Figure 2 shows that before and after the experiment, the students in the experimental group made significant progress in physics. Before and after the experiment, the control group (traditional learning model group) had some specific changes in the understanding of rhythm dance learning behavior, but after testing the data of this group, the results showed no significant difference.

5. Conclusion

Although this article has achieved certain research results in the literature reference research method, the second-order FDTD method and the case study method, there are still many shortcomings. The second-order FDTD method has a lot of in-depth content worthy of research on the experimental research methods of small group teaching mode in college aerobics teaching. There are many steps in the decision-making process that are not involved because of space and personal ability. In addition, the actual application effect of the improved algorithm can only be compared with the traditional model from the level of theory and simulation.

Funding

This article is not supported by any foundation.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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